

REMARKS

The present application was filed on December 27, 2001. In a previous Office Action, the Examiner required election of claims. Subsequently, Applicants elected the claims of Invention I (claims 1-28) without traverse and canceled claims 29-38. Claims 1-28 are therefore pending.

Applicants have amended the specification to correct errors of a typographical nature. It should be noted that the amendment on page 16 also improves readability of the text. It should also be noted that similar amendments were made in U.S. Patent Application No. 10/123,334, filed on April 15, 2002, now U.S. Patent No. 7,043,474, which contains some subject matter similar to subject matter herein.

In the present Office Action, the Examiner: (1) rejected claims 14-24 under 35 U.S.C. §101; (2) objected to claim 25; and (3) rejected claims 1-28 as being anticipated by Jain et al., U.S. Patent No. 5,915,250.

Regarding the rejection in (1), Applicants respectfully disagree. Independent claim 1 recites the following:

A data processing system comprising a data processor, a graphical user interface and a **memory** that stores a collection of digital images in an image database, said data processor operating in accordance with a **stored program** for determining the semantic meaning of images in accordance with a set of perceptual semantic categories that were previously derived from human observers and that represent important semantic cues in the human perception of images, where each semantic category is modeled through a combination of perceptual features that define the semantics of that category and that discriminate that category from other categories, where for each semantic category there exists a set of the perceptual features as a complete feature set CFS, said data processor extracting perceptual features from an input image and applying a perceptually-based metric to determine the semantic category for the input image.

Claim 1 (emphases added). The Examiner asserts that claim 14 is non-statutory because the terminology “a memory” and “a stored program” alone have no set definition. The Examiner also asserts that “[a] statutory product with descriptive material must include a positive

recitation of the computer readable medium -- M.P.E.P. 2106, case law, USPTO policy, all are founded on this.” Applicants respectfully disagree with these assertions.

The section 35 U.S.C. §101 states the following:

Whoever invents or discovers any new and useful process, **machine**, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. §101 (2005) (emphasis added). In claim 14, Applicants claim a machine that is a data processing system. The data processing system includes a memory and a data processor. The data processor operates in accordance with a stored program for determining semantic meaning of images. The terms “memory” and “stored program” are well known terms. It is also well known that a data processor can operate in accordance with a stored program for causing a data processing system to perform certain functions. According to M.P.E.P. §2106:

If a claim defines a useful machine or manufacture by identifying the physical structure of the machine or manufacture in terms of its hardware or **hardware and software combination**, it defines a statutory product.

M.P.E.P. §2106 IV.B.2.(a) (page 2100-14, rev. 3, Aug. 2005) (citations omitted) (emphasis added). Claim 14 identifies a physical structure of a machine having hardware of a memory and a data processor and software of a stored program, where the data processor operates in accordance with the stored processor to perform certain useful functions. Applicants therefore respectfully submit that claim 14 meets the requirements of 35 U.S.C. §101 and of M.P.E.P. §2106 and defines statutory subject matter. Applicants also submit that claims 15-24, which depend from claim 14, also define statutory subject matter. Applicants request the 35 U.S.C. §101 rejection to claims 14-24 be withdrawn.

With regard to the objection in (2), the Examiner objected to claim 25 because the claims were difficult to understand. In particular, the Examiner asserted that one skilled

in the art would not understand the subject matter of “the semantic techniques being modeled using multidimensional scaling and hierarchical clustering techniques”.

Applicants respectfully disagree. In particular, Applicants describe multidimensional scaling from page 12, line 12 to page 13, line 7 and cite the reference J. Kruskal, and M. Wish, *Multidimensional scaling*, Sage Publications, London, 1978 as containing more information on multidimensional scaling. Applicants go on to describe hierarchical clustering techniques on page 13, lines 9-26 and cite the reference R. Duda, and P. Hart, *Pattern classification and scene analysis*, John Wiley & Sons, New York, NY, 1973 as containing more information on hierarchical clustering techniques. These sections and cited references attest to the fact that the terms “multidimensional scaling” and “hierarchical clustering techniques” are known to those skilled in the art and are not confusing. Applicants respectfully request the objection to claim 25 be withdrawn.

With regard to (3), the Examiner rejected claims 1-28 under 35 U.S.C. §102(b) as being anticipated by Jain. Applicants respectfully disagree. For ease of reference, Applicants have divided the following argument into sections.

Independent Claim 1

Independent claim 1 recites in part the subject matter of “deriving a set of perceptual semantic categories **for representing important semantic cues in the human perception of images**, where each semantic category is modeled through a combination of perceptual features that define the semantics of that category and that discriminate that category from other categories” (emphasis added). In Applicants’ specification, Applicants state the following:

This method is also based on the set of perceptual semantic categories that represent the most important semantic cues in the human perception of image similarity. *These include*, but are not limited to, *people, landscapes, waterscapes, landscapes with people, objects indoors, objects outdoors, indoor scenes, flowers, animals*, etc.

Page 5, lines 26-30 of Applicants' specification (emphasis added). See also page 18, lines 8-27 of Applicants' specification. Therefore, the set of perceptual semantic categories for representing important semantic cues in the human perception of images could include, e.g., people, landscapes, waterscapes, landscapes with people, objects indoors, objects outdoors, indoor scenes, flowers, and animals.

The Examiner cites the Abstract and col. 4, lines 20-25 of Jain for purported disclosure of "deriving a set of perceptual semantic categories for representing important semantic cues in the human perception of images". Jain states the following:

Various types of *visual queries* are supported by the VIR Engine as follows:

Query by image property, wherein a user specifies a property or attribute of the image, such as the arrangement of colors, or they may sketch an object and request the system to find images that contain similar properties. The Engine also allows the user to specify whether or not the location of the property in the image (e.g., blue at the bottom of the image or blue anywhere) is significant.

Jain, col. 4, lines 18-28 (emphases added). It is noted that this cited text of Jain appears unrelated to deriving a set of perceptual semantic categories and instead appears related to allowing a user to specify a property or attribute of an image, where the property or attribute is used to search for images having that property or attribute.

Furthermore, it appears that Jain is not concerned with deriving a set of deriving a set of perceptual semantic categories **for representing important semantic cues in the human perception of images** as recited in independent claim 1. For instance, Jain states that "[t]he VIR Engine looks at the pixel data in the images, and analyzes the data with respect to visual attributes such as color, texture, shape, and structure. These visual attributes are called 'primitives', and the image characterization is built up from these." Jain, col. 6, lines 23-27. Jain further describes primitives in the following (under the heading of "Primitives"):

Image objects have computable image properties or attributes that can be localized in the spatial domain (arrangement of color), the frequency domain (sharp edge fragments), or by statistical methods (random texture). These computed features are called primitives. Primitives are either global, computed over an entire image, or local, computed over smaller regions of the image. For each generic image property such as color, texture, and shape, a number of primitives may be computed. Besides this conceptual definition of a primitive, the specific implementation may also be referred to as a primitive. For instance, the collection of functions to extract and compare an image attribute may be referred to as a primitive.

Jain, col. 7, line 62 to col. 8, line 7. Jain additionally describes default primitives as being Local Color, Global Color, Structure, and Texture. Jain, col. 11, line 61 to col. 12, line 9. Jain also describes an extensible VIR engine and system, and in the section describing the extensible VIR engine and system Jain states “[a] primitive is a semantically meaningful feature of an image. Thus color, texture, and shape are all general image primitives.” Jain, col. 13, lines 48-50.

These cited sections of Jain appear unrelated to deriving a set of perceptual semantic categories **for representing important semantic cues in the human perception of images** (e.g., people, landscapes, waterscapes, landscapes with people, objects indoors, objects outdoors, indoor scenes, flowers, and animals) as recited in claim 1. Consequently, Applicants respectfully submit that Jain does not teach at least the subject matter of “deriving a set of perceptual semantic categories for representing important semantic cues in the human perception of images” as recited in claim 1. Claim 1 is therefore patentable over Jain.

Dependent Claim 2

Dependent claim 2 recites “A method as in claim 1, wherein the perceptual features and their combinations are derived through subjective experiments performed with human observers.” At, e.g., page 11, line 21 to page 19, line 20, Applicants recite in detail how perceptual features and their combinations are derived through subjective experiments performed with human observers.

The Examiner cites col. 4, lines 20-31 of Jain as purportedly disclosing the subject matter of claim 2. Jain states the following:

Query by image property, wherein a user specifies a property or attribute of the image, such as the arrangement of colors, or they may sketch an object and request the system to find images that contain similar properties. The Engine also allows the user to specify whether or not the location of the property in the image (e.g., blue at the bottom of the image or blue anywhere) is significant.

Query by image similarity, wherein a user provides an entire image as a query target and the system finds images that are visually similar.

Jain, col. 4, lines 20-31. This cited section of Jain appears to be related to visual queries supported by the VIR engine of Jain (col. 4, lines 18-19 of Jain) and there is no disclosure in this cited section (or of any section in Jain) of “the perceptual features and their combinations are derived through subjective experiments performed with human observers” as recited in claim 2.

Therefore, dependent claim 2 is patentable over Jain.

Independent Claims 14 and 25

Independent claim 14 recites the subject matter of “said data processor operating in accordance with a stored program for determining the semantic meaning of images in accordance with a set of perceptual semantic categories that were previously derived from human observers and that represent important semantic cues in the human perception of images”. This subject matter from independent claim 14 is similar to the subject matter in independent claim 1 of “deriving a set of perceptual semantic categories for representing important semantic cues in the human perception of images” and in dependent claim 2 of “wherein the perceptual features and their combinations are derived through subjective experiments performed with human observers”. Therefore, the arguments given above with respect to independent claim 1 and dependent claim 2 are also applicable to claim 14. Consequently, claim 14 is patentable over Jain for at least the reasons given above with respect to independent claim 1 and dependent claim 2.

Independent claim 25 recites the subject matter of “comprising program instructions for processing a set of perceptual semantic categories for representing semantic cues related to the manner in which human observers perceive and organize images, the semantic categories being modeled using multidimensional scaling and hierarchical clustering techniques and comprising a combination of perceptual features that define the semantics of a particular category and that discriminate that category from other categories, where the perceptual features and their combinations are derived through subjective experiments performed with human observers”.

This subject matter from independent claim 25 is similar to the subject matter in independent claim 1 of “deriving a set of perceptual semantic categories for representing important semantic cues in the human perception of images” and in dependent claim 2 of “wherein the perceptual features and their combinations are derived through subjective experiments performed with human observers”. Therefore, the arguments given above with respect to independent claim 1 and dependent claim 2 are also applicable to claim 25. Consequently, claim 25 is patentable over Jain for at least the reasons given above with respect to independent claim 1 and dependent claim 2.

Dependent Claims 3-13, 15-24, and 26-28

Dependent claims 3-13 depend from independent claim 1, dependent claims 15-24 depend from independent claim 14, and dependent claims 26-28 depend from independent claim 25. As independent claims 1, 15, and 25 are patentable, dependent claims 3-13, 15-24, and 26-28 are patentable for at least the reasons given above.


Conclusion

It is respectfully submitted that claims 14-24 define patentable subject matter and the 35 U.S.C. §101 rejection to claims 14-24 should be withdrawn. It is also submitted that claim 25 can be understood by one skilled in the art and the objection to claim 25 should

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Art Unit: 2621

be withdrawn. It is finally submitted that claims 1-28 are patentable over Jain and the 35 U.S.C. §102 rejection to claims 1-28 should be withdrawn.

Respectfully submitted:


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Date

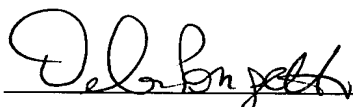
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